IN THE CLAIMS

Applicant acknowledges that, in the instant Office Action, the Examiner has withdrawn of claims 1-51 and 53-77 from consideration.

Applicant herein submits new Claims 79-108 as dependent claims readable on the previously elected invention of Group III. In the following claims, applicant has not renumbered original indpendent Claims 52 and 78.

The claims submitted herein contain 2 (two) original independent claims and 30 (thirty) new dependent claims. A fee for 30 (thirty) dependent claims is enclosed.

The new claims herein submitted contain no new matter, and fall completely within the scope of the material set out in the originally filed documents.

I claim:

1-51 (withdrawn)

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52. (original):

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A computer readable medium embodying program instructions for supplying power to a powered device which is adapted to receive power selectably from a battery and a configurable power supply, comprising:

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

53-77 (withdrawn)

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79. (new):

The configurable power supply of claim 52, further including:

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a processor for performing said program instructions embodied in said computer readable medium, the processor also being for performing control functions;

a processor-controlled analog-to-digital converter interconnected to said battery via an interface comprised of at least one of one or more input/output ports accessible to a plurality of conductors and contacts of a connector assembly, said interface being so configured as to provide a means of controllably electrically coupling at least one of one or more of said resistive loads on the battery for outputting to the analog-to-digital converter at least one minimum battery voltage, instead of a previous outputting of at least one maximum battery voltage;

a memory accessible to the processor for storing voltage values acquired by the analog-to-digital converter;

The computer readable medium further including a look-up table, also stored in the memory, comprising a substantial matrix of battery design parameters expressed as voltage values of a multiplicity of batteries arranged by both chemistry type and typical cells-per-pack configurations;

said computer-readable medium also further including program instructions for configuring said processor to perform a first comparing of the acquired maximum voltage value to each maximum design voltage value from said look-up table, and

to perform a second comparing of the acquired minimum voltage value to each minimum design voltage value from said look-up table,

whereby said first comparing results in said acquired maximum voltage value being excessively elevated as compared to said maximum design voltage values from said look-up table, thereby determining said anticipated fully-charged battery, and

whereby said second comparing results in said acquired minimum voltage value being excessively depressed when as compared to said minimum design voltage values from said look-up table, thereby determining an anticipated nearly-discharged battery.

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80. (new):

The determining of an anticipated fully-charged battery or a nearly-discharged battery of claim 79, wherein said determining is performed prior to the execution of further program instructions for configuring said processor to output a first voltage value to said configurable power supply.

81. (new):

The look-up table of claim 79, wherein all indicated values are recalibrated to compensate for an additional load of a means for controlling the direction of electrical flow that is located so as to be electrically coupled to conductors of a receptacle of said connector assembly so as to provide said configurable power supply access to both said battery and a powered-device, said receptacle interface being located along a housing of said battery.

82. (new):

The connector assembly of claim 79, further including a electively user-positionable connector plug which, in a first position, transfers electrical signals between the configurable power supply and said battery, instead of being in a second position for transferring signals between said configurable power supply and a battery-powered device.

83. (new):

The selectively user-positionable connector plug of claim 82, further including program instructions for configuring an accessible processor to generate at least one of one or more visual indicia to a user, thereby prompting said user to manipulate said connector plug so that its contacts now transfer signals between said configurable power supply and said battery-powered device.

84. (new):

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The transfer of electrical signals between said configurable power supply and said battery-powered device of claim 82, further including in both said configurable power supply and said battery-powered device a means of inter-device communications for transferring signals.

85. (new):

The means of inter-device communications of claim 84, further including additional program instructions for configuring processors at said configurable power supply and at said battery-powered device respectively to transfer data signals by at least one communications medium selected from the group consisting of powerline modulation, and wireless infrared, and serial/parallel data protocols.

86. (new):

The acquired minimum and maximum battery voltage values of claim 79, wherein said values are retained in memory for use in further program instructions to configure said processor for calculating a voltage that represents at least a first output value of said configurable power supply.

87. (new):

The configurable power supply of claim 79, wherein said power supply is embedded into aircraft systems.

88. (new):

The configurable power supply of claim 79, wherein said power supply is incorporated into a discrete modular apparatus for interconnecting in-line between an existing external power-conversion adapter and said connector assembly.

89. (new):

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The computer readable medium of claim 52, wherein said computer readable medium is embedded, and said program instructions are written to operate in an embedded environment.

90. (new):

The computer readable medium of claim 52, wherein said computer readable medium is incorporated into a battery pack, instead of a configurable power supply.

91. (new):

The computer readable medium of claim 79, wherein said program instructions configure said processor to acquire said maximum battery voltage value prior to acquiring said minimum battery voltage value, in order to take advantage of a known recovery capability of said battery.

92. (new):

The computer readable medium of claim 79, further embodying program instructions for configuring the processor to control a switch located in a circuit between said analog-to-digital converter and said battery, for selectively electrically coupling into the circuit at least one of one or more resistive elements.

93. (new):

The configurable power supply of claim 52, further including:

a general-purpose processor capable of accessing an analog-to-digital converter for acquiring voltage values of said battery;

a means of interconnecting said battery to an A/D converter including a receptacle at said battery for mating to a connector plug;

a memory to which said processor writes:

an acquired first value expressing a maximum output-voltage of said battery in a no-load condition;

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a second value being retrieved from a look-up table comprising a substantial matrix of predetermined battery design parameters expressed as both maximum- and minimum-voltage reference values for a multiplicity of battery cells-per-pack configurations arranged by chemistry types;

said computer readable medium further embodying program instructions for configuring said processor for performing a comparing of the acquired first value to the retrieved second value as a maximum-voltage reference value, and

said processor analyzes the results of said comparing by determining whether said acquired first value is within a predetermined tolerance range of voltage variance when compared to the retrieved maximum-voltage reference value, whereby said analyzing resulting in either:

accepting said comparing as confirming that both voltage values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired first value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved maximum-voltage reference value, whereupon said processor discards the rejected maximum-voltage reference value and then retrieves from among the previously unselected maximum-voltage values in said look-

up table another reference value for repeating said comparing and analyzing functions;

said retrieving, comparing and analyzing functions repeat until said analyzing results in an accepting of both the acquired first and retrieved maximum-voltage reference values, whereupon said processor writes both values to memory;

a means of electrically engaging at least one of one or more resistive elements as a predetermined electrical pre-load temporarily applied to said battery for said analog-to-digital converter acquiring from said battery a third value expressed as a minimum output-voltage, said processor then writing said acquired third value to memory;

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further program instructions for configuring said processor for retrieving from said look-up table a fourth value expressing a predetermined minimum design voltage of a battery of the same cells-per-pack configuration and chemistry type as that of the previously accepted maximum-voltage reference value, said processor then writing the retrieved value to memory as a minimum-voltage reference value;

additional program instructions for configuring said processor for performing a comparing of the acquired third value to the retrieved minimum-voltage reference value;

further program instructions for configuring said processor for analyzing the results of said comparing by determining whether said acquired third value is within a predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired third value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, whereupon said processor retrieves from among the previously unselected minimum-voltage reference

values in said look-up table another reference value for repeating said comparing and analyzing functions;

said retrieving, comparing and analyzing operations repeat until said analyzing results in an accepting of both the acquired third and retrieved maximum-voltage reference values, whereupon said processor writes both values to memory;

configuring said processor by further program instructions for executing a LIST function comprised of a compiling of the four previously accepted voltage values stored in memory, and

configuring said processor by additional program instructions for performing a SORT function upon the listed values by arranging the four previously accepted voltage values in ascending order,

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whereby resulting in only a correctly determined battery chemistry type from among those in said look-up table yielding sorted values listed in a specific sequential order consisting of:

first, the retrieved minimum-voltage reference value;
second, the acquired minimum battery voltage value;
third, the acquired maximum battery voltage value, and
fourth, the maximum-voltage reference value.

94. (new):
The look-up table of claim 93, further including a charge rate for each battery chemistry type as a variable in a processor calculation to determine an impedance value of said at least om of one or more resistive elements.

95. (new):
The performing of a SORT function upon the listed values of claim 93, wherein an acquired maximum-voltage value that varies significantly from said predetermined battery design parameter because said battery being fully charged causes it to

output an excessively elevated maximum voltage, whereupon said acquired maximum-voltage value is adjusted by the predetermined tolerance range of voltage variance being calculated into said maximum-voltage value prior to said sorting.

96. (new):

The performing of a SORT function upon the listed values of claim 93, wherein an acquired minimum-voltage value that varies significantly from said predetermined battery design parameter because said battery being nearly discharged causes it to output an excessively low minimum voltage, whereupon said acquired minimum-voltage value is adjusted by the predetermined tolerance range of voltage variance being calculated into said minimum-voltage value prior to said sorting.

78. (original):

A method for determining the power requirements of a powered device adapted to receive power selectably from a battery and a configurable power supply, comprising:

preloading said battery with a resistive load;

varying said resistive load on said battery;

detecting the extent of voltage sag upon preloading said battery, and

analyzing said detected voltage sag and determining the anticipated fully charged battery voltage,

thereby supplying the appropriate voltage to the powered device from said configurable power supply, instead of from said battery.

97. (new):

The method of claim 78, further including a method of determining an anticipated fully charged or nearly discharged battery, comprising:

providing an apparatus for performing program instructions, comprising:

providing a processor capable of performing control functions;

providing a processor-controlled analog-to-digital converter interconnected to said battery via an interface comprised of at least one of one or more input/output ports accessible to a plurality of conductors and contacts of a connector assembly, said interface being so configured as to provide a means of controllably electrically coupling at least one of one or more resistive elements as a temporary electrical preloading of said battery for outputting to said analog-to-digital converter at least one minimum battery voltage, instead of a previous outputting of at least one maximum battery voltage;

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providing a memory accessible to said processor for storing voltage values acquired by said analog-to-digital converter;

providing a computer-readable medium including a look-up table, also stored in said memory, comprising a substantial matrix of battery design parameters expressed as voltage values of a multiplicity of batteries arranged by both chemistry type and typical cells-per-pack configurations;

said computer-readable medium further including program instructions for configuring said processor to perform a first comparing of the acquired maximum voltage value to each maximum design voltage value from said look-up table, and

further including program instructions for configuring said processor to perform a second comparing of the acquired minimum voltage value to each minimum design voltage value from said look-up table,

whereby said first comparing results in said acquired maximum voltage value being excessively elevated as compared to said maximum design voltage values from said look-up table, thereby determining said anticipated fully-charged battery, and

whereby said second comparing results in said acquired minimum voltage value being excessively depressed when as compared to said minimum design voltage values from said look-up table, thereby determining said anticipated nearly-discharged battery.

98. (new):

The method of determing an anticipated fully charged battery or nearly discharged battery of claim 97, wherein excessively elevated or excessively depressed voltage values are compensated for by additional program instructions for configuring said processor for adjusting the excessive voltage values downward or upward respectively by a predetermined voltage tolerance amount, resulting in adjusted maximum- or minimum-voltage values that are available for other program instructions.

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99. (new):

The preloading of claim 78, wherein at least one of one or more resistive elements is a power resistor having an impedance value substantial enough to simulate an operational load of said powered device.

100. (new):

The temporary electrical preloading of claim 97, wherein the resistive value of at least one of said one or more resistive elements is determined by the charge rate of a battery based on its chemistry-type, as expressed in a look-up table that lists batteries by chemistry types and charge rates.

101. (new):

The determining of a nearly-depleted battery of claim 97, wherein said excessively depressed minimum voltage value indicates a potentially unsafe battery.

102. (new):

The determining of a nearly-depleted battery of claim 101, wherein said determining further includes a means of notifying a user of said potentially unsafe battery.

103. (new):

The method of claim 78, further including a method of determining the chemistry-type of a battery, comprising:

providing a general-purpose processor capable of accessing an analog-to-digital converter for acquiring voltage values of said battery;

providing a means of interconnecting said battery to said A/D converter including a receptacle at said battery for mating to a user-positionable connector plug;

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providing a memory to which said processor writes:

an acquired first value expressing a maximum output-voltage of said battery in a no-load condition;

a second value being retrieved from a look-up table comprising a substantial matrix of predetermined battery design parameters expressed as both maximum- and minimum-voltage reference values for a multiplicity of battery cells-per-pack configurations arranged by chemistry types;

providing a computer-readable medium embodying program instructions for configuring said processor for performing a comparing of the acquired first value to the retrieved second value as a maximum-voltage reference value, and

said processor analyzes the results of said comparing by determining whether said acquired first value is within a predetermined tolerance range of voltage variance when compared to the retrieved maximum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both voltage values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired first value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved maximum-voltage reference value, whereupon said processor discards the rejected maximum-voltage reference value and then retrieves from among the previously unselected maximum-voltage values in said look-up table another reference value for repeating said comparing and analyzing functions;

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said retrieving, comparing and analyzing functions repeat until said analyzing results in an accepting of both the acquired first and retrieved maximum-voltage reference values, and said processor writes both values to memory;

providing a means of electrically engaging at least one of one or more resistive elements as a predetermined electrical pre-load temporarily applied to said battery for said analog-to-digital converter acquiring from said battery a third value expressed as a minimum output-voltage, said processor then writing said acquired third value to memory;

providing further program instructions for configuring said processor for retrieving from said look-up table a fourth value expressing a predetermined minimum design voltage of a battery of the same cells-per-pack configuration and chemistry type as that of the previously accepted maximum-voltage reference value, said processor then writing the retrieved value to memory as a minimum-voltage reference value;

providing additional program instructions for configuring said processor for performing a comparing of the acquired third value to the retrieved minimum-voltage reference value;

providing further program instructions for configuring said processor for analyzing the results of said comparing by determining whether said acquired third value is

within a predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, thereby said analyzing resulting in either:

accepting said comparing as confirming that both values are substantially the same, whereupon said processor writes both values to memory, or

rejecting said comparing because said acquired third value falls outside said predetermined tolerance range of voltage variance when compared to said retrieved minimum-voltage reference value, whereupon said processor retrieves from among the previously unselected minimum-voltage reference values in said look-up table another reference value for repeating said comparing and analyzing functions;

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said retrieving, comparing and analyzing operations repeat until said analyzing results in an accepting of both the acquired third and retrieved maximum-voltage reference values, and said processor writes both values to memory;

configuring said processor by further program instructions for executing a LIST function comprised of a compiling of the four previously accepted voltage values stored in memory, and

configuring said processor by additional program instructions for performing a SORT function upon the listed values by arranging the four previously accepted voltage values in ascending order,

whereby resulting in only a correctly determined battery chemistry type from among those in said look-up table yielding sorted values listed in a specific sequential order consisting of:

first, the retrieved minimum-voltage reference value;
second, the acquired minimum battery voltage value;
third, the acquired maximum battery voltage value, and
fourth, the maximum-voltage reference value.

104. (new):

The receptacle for mating to a user-positionable connector plug of claim 103, wherein the connector plug includes a fist position for enabling access of said apparatus to said battery, and a second position for enabling access of said apparatus to a powered device.

105. (new):

The receptacle for mating to a user-positionable connector plug of claim 103, further including a means of controlling the direction of electrical flow strapped across contacts of said receptacle, resulting in said processor having access to both said battery and said powered-device, whereby the need for the connector plug to be user-positionable is eliminated.

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106. (new):

The matrix of predetermined battery design parameters of claim 103, wherein said predetermined design parameters substantially represent industry standard values for charge rates, minimum and maximum voltages of individual battery cells, as well as typical battery pack configurations for at least one identifiable category of battery-powered devices.

107. (new):

The category of battery-powered devices of claim 106, wherein said category is derived from analyzing battery voltages and the typical number of cells normally required to power a particular group of substantially similar devices.

108. (new):

The predetermined tolerance range of voltage variance of claim 103, wherein said tolerance range allows for voltage variances caused by either fully-charged or nearly discharged batteries.